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Cyanotoxins as a possible cause of fish and waterfowl death in the kazanka river (Russia)

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Abstract

© SGEM2018. On August 2016 in the Kazanka River (the tributary of the Volga River) was the mass mortality of fish (gibel carp Carassius gibelio) and waterfowl (mallard Anas platyrhynchos). Investigation of the causes of mortality showed that during this period the mass development of phytoplankton was reported (number 43.9-83.1 million cells/L and biomass in the interval 2.20-8.12 mg/L). Biomass of the group of blue-green algae was 0.76-3.25 mg/L. Planktolyngbya limnetica (Lemm) Kom.-Legn. et Cronb (94.6 % of the number) and Aphanizomenon flos-aquae (L.) Ralfs. (70.2 % of the number) were the dominant species on various area of the river. The content of cyanotoxins in water according to the results of ELISA was 1.4-12.1 µg/L (microcystins) and 0.057-0.294 µg/L (anatoxin-a). Content of microcystins (1.96-3.16 µg/kg) and anatoxin-a (1.56-5.21 µg/kg) in fish and duck muscles were determined. Chemical analysis of the river water showed a high content of dissolved oxygen (10.0-12.1 mg/L); all chemical parameters were below the water quality standards. Thus, the probable cause of the death of fish and ducks in the Kazanka River on August 2016 was cyanotoxins, produced by blue-green algae.

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Keywords

Blue-green algae, Cyanotoxins, ELISA, Waterfowl and fish mortality

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